

CLAIMS

- ^{Sub 9} 1. A cementitious composition comprising:
- (a) about 30 wt.% to about 75 wt.% calcium sulfate beta-hemihydrate;
 - (b) about 10 wt.% to about 40 wt.% Portland cement;
 - (c) about 4 wt.% to about 20 wt.% silica fume; and
 - (d) about 1 wt.% to about 40 wt.% pozzolanic aggregate filler.

2. The composition of claim 1 wherein said composition is ~~substantially~~ free of alpha-gypsum.

3. The composition of claim 1 wherein the Portland cement is Type III Portland cement.

4. The composition of claim 1 wherein the silica fume is about 4 wt% to about 8 wt.% of the composition.

^{Sub 8} 5. The composition of claim 1 wherein the pozzolanic filler is about 10 wt% to about 40 wt.% of the composition and comprises pumice.

6. The composition of claim 1 wherein the pozzolanic filler is about 1 wt% to about 10 wt.% of the composition and comprises Fillite.

7. The composition of claim 1 comprising an ~~effective amount of~~ at least one of set control additives, water reducing agents and water repellent additives.

8. A self-leveling floor composition comprising:

- (i) about 25 wt.% to about 75 wt.% of the composition of claim 1; and
- (ii) about 75 wt.% to about 25 wt.% sand.

Sub ca 9. The self-leveling floor composition of claim 8 wherein said composition (i) comprises about 71 wt.% calcium sulfate beta-hemihydrate, about 20 wt.% Portland cement, about 6 wt.% silica fume and about 2 wt.% pozzolanic filler.

10. The self-leveling floor composition of claim 9 wherein said pozzolanic filler is Fillite.

11. A road patching composition comprising:
(i) about 25 wt.% to about 100 wt.% of the composition of claim 1; and
(ii) about 75 wt.% to about 0 wt.% sand.

12. Fire-proofing sprays and fire-stopping materials comprising the composition of claim 1 wherein said pozzolanic filler comprises at least one of Fillite and perlite.

13. Fire-proofing sprays and fire-stopping materials of claim 12 further comprising about 1 wt.% to about 30 wt.% unexpanded vermiculite.

14. The fire-proofing sprays and fire-stopping materials of claim 12 further comprising:
(e) up to about 2 wt.% glass fibers; and
(f) up to about 1 wt.% of a thickening agent selected from the group consisting of cellulose derivatives, acrylic resins and mixtures thereof.

15. A fiberboard comprising:
(i) about 70 wt.% to about 90 wt.% of the composition of claim 1; and
(ii) about 30 wt.% to about 10 wt.% of a fiber component selected from the group consisting of wood fibers, paper fibers, glass fibers, polyethylene fibers, polypropylene fibers, nylon fibers, and other plastic fibers.

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16. The fiberboard of claim 15 wherein said composition (i) comprises about 74 wt.% calcium sulfate beta-hemihydrate, about 20 wt.% Portland cement, and about 6 wt.% silica fume.

^{Sub C10} 17. A water resistant construction material prepared by combining a cementitious composition with a slight stoichiometric excess of water, said cementitious composition comprising:

- (a) about 30 wt.% to about 75 wt.% calcium sulfate beta-hemihydrate;
- (b) about 10 wt.% to about 40 wt.% Portland cement;
- (c) about 4 wt.% to about 20 wt.% silica fume; and
- (d) about 1 wt.% to about 40 wt.% pozzolanic filler.

^B 18. The construction material of claim 17 wherein the cementitious composition is ~~substantially~~ free of alpha-gypsum.

^{Sub C11} 19. The construction material of claim 17 wherein the Portland cement of paragraph (b) is Type III Portland cement.

20. The construction material of claim 17 wherein the pozzolanic filler of paragraph (d) is about 10 wt.% to about 40 wt.% of the composition and comprises pumice.

¹⁶ 21. The construction material of claim 17 wherein the silica fume is about 4 wt.% to about 8 wt.% of the composition.

^{Sub C12} 22. The construction material of claim 17 wherein the cementitious composition includes an effective amount of at least one of set control additives, water reducing agents and water repellent additives.

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23. A water resistant construction material having a thickness of about 1/8 inch, said material prepared by combining a cementitious composition with a slight stoichiometric excess of water, said cementitious composition comprising:

- (a) about 30 wt.% to about 75 wt.% calcium sulfate beta-hemihydrate;
- (b) about 10 wt.% to about 40 wt.% Portland cement;
- (c) about 4 wt.% to about 20 wt.% silica fume; and
- (d) about 1 wt.% to about 40 wt.% pozzolanic

aggregates
filler.

24. The construction material of claim 23 wherein the cementitious composition is substantially free of alpha-gypsum.

25. The construction material of claim 23 wherein the Portland cement of paragraph (b) is Type III Portland cement.

26. The construction material of claim 23 wherein the cementitious composition comprises:

- (a) about 70 wt.% to about 75 wt.% calcium sulfate beta hemihydrate;
- (b) about 15 wt.% to about 25 wt.% Portland cement;
- (c) about 4 wt.% to about 8 wt.% silica fume; and
- (d) about 1 wt.% to about 10 wt.% pozzolanic

aggregates
filler.

27. The construction material of claim 23 wherein the cementitious composition includes an effective amount of at least one of set control additives, water reducing agents and water repellent additives.

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28. A board comprising:
first and second cover sheets; and
a cementitious composition disposed between
the first and second cover sheets, said composition
comprising:
 (a) about 30 wt.% to about 75 wt.% calcium
sulfate beta-hemihydrate;
 (b) about 10 wt.% to about 40 wt.% Portland
cement;
 (c) about 4 wt.% to about 20 wt.% silica
fume; and
 (d) about 1 wt.% to about 40 wt.% pozzolanic
filler.

29. The board of claim 28 wherein the
cementitious composition is substantially free of
alpha-gypsum.

30. The board of claim 28 wherein the first
and second cover sheets are made from at least one of a
fiberglass mat and a fiberglass scrim.

31. The board of claim 28 wherein the
Portland cement of paragraph (b) is Type III Portland
cement.

32. The board of claim 28 wherein the
pozzolanic filler of paragraph (d) is about 10 wt.% to
about 40 wt.% of the composition and comprises pumice.

33. A method of preparing a construction material comprising the steps of:

(a) mixing about 30 wt.% to about 75 wt.% calcium sulfate beta-hemihydrate, about 10 wt.% to about 40 wt.% Portland cement, about 4 wt.% to about 20 wt.% silica fume, and about 1 wt.% to about 40 wt.% pozzolanic filler to result in a cementitious composition; and

(b) mixing the cementitious composition formed in step (a) with a slight stoichiometric excess of water.

34. The method of claim 33 further comprising:

(c) pouring the cementitious composition on a first cover sheet; and

(d) placing a second cover sheet over the cementitious composition.

35. The method of claim 34 wherein the first and second cover sheets are made from at least one of a fiberglass matt and a fiberglass scrim.

36. The method of claim 34 further comprising:

(e) cutting the material produced in step (d) into boards; and

(f) curing the boards at room temperature and a humidity of about 30% to about 90% for one to seven days.

37. The method of claim 34 further comprising:

(e) cutting the material produced in step (d) into boards; and

(f) wrapping the boards in plastic for at least about three days.

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